High Probability Low Impact (HPLI) security threats

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High Probability Low Impact

Extend the focus of PROTECTRAIL

- Main objective of PROTECTRAIL project is to provide an interoperability framework to integrate several railway security solutions.
- Project objective was extended to cover High Probability Low Impact (HPLI) security events
- Aggregated HPLI security events have big impact on operation cost
- Integrate HPLI solutions to the PROTECTRAIL interoperability framework

High Probability Low Impact

9 solutions

Company	HPLI Solutions
BOMBARDIER	Door Blocking Detection System
BOMBARDIER	On-board Crowd Density Detection (OBCD)
BOMBARDIER	Video Privacy Protector
BOMBARDIER	Integration of legacy systems
ALSTOM THALES	On-board to ground protocol for emergency and situation assessment
TNO innovation for life	Sherlock solution to relocate perpetrators and suspects post incident
Multitel	People flow measurement
THALES	Reporting of events from the field
aitek	Trespassing/restricted area encroachment

Video Privacy Protector

A technology enabler

Why do we need it?

- European directives (*95/46/EC, WP29*) regulates the **processing** of **personal data** within EU.
- Operators need to use the recorded videos for an extended period for various purposes:
  - Verification of operational delays and downtimes to reduce the penalties
  - Use the recorded videos for training purposes and therefore improving daily operations through pro-active measures

Country	Maximum Video Storage Period (in days)
Belgium	1
Denmark	30
Finland	3
France	30
Germany	To be deleted as soon as purpose is served
Greece	15
Italy	Case by case
Portugal	30
Spain	30
Sweden	30
United Kingdom	31

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KIWISECURITY
AUTOMATING VIDEO SURVEILLANCE

KiwiVision®
Privacy Protector®

Video Privacy Protector

A technology enabler

How does it work?

- The Privacy Protector obscures any moving objects in the field of view and therefore making identification of individuals no longer possible
- System first starts with learning phase, where it learns the background so that it will left unscrambled. The system also capable of continuously learning the changing background.
- The privacy protected video can be stored in a NVR using asymmetric encryption and accessible as a video stream

Privacy Protected Image

2nd Option - Coloured blurring

Door Blocking Detection System

A use case for Privacy Protector

Door Blocking Detection System

A use case for Privacy Protector

Why do we need?

- Train operators get penalised for delays in daily operation and abnormality of the door status is one of the reason
- In most cases abnormality caused by, passengers intentionally by block the door
- Need a solution to record and store such incidents with relevant video sources for longer period, while protecting the privacy of individuals.
- With the Privacy Protector the operator can use recorded video along the privacy protection law.

Door Blocking by Passenger

Door Blocking Detection System

A use case for Privacy Protector

How does it work?

- Any abnormality with door status will be reported to relevant parties using CAP event with privacy protected videos and other necessary information.
- The aggregated event details will be available from Event Map reporting software
- The system also provides periodical reports of door blocking events for the customer

Door blocking event received by SOCC

Periodic Incident Report

Reports listing for door blocking incidents

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Report	Date & Time
incident_report_1398253971_eventId_3.htm	Wed, 23 Apr 2014 11:52:51 GMT
incident_report_1398253951_eventId_2.htm	Wed, 23 Apr 2014 11:52:31 GMT
incident_report_1398253940_eventId_1.htm	Wed, 23 Apr 2014 11:52:20 GMT
incident_report_1398249985_eventId_1.htm	Wed, 23 Apr 2014 10:46:26 GMT
incident_report_1397719606_eventId_1.htm	Thu, 17 Apr 2014 07:26:46 GMT

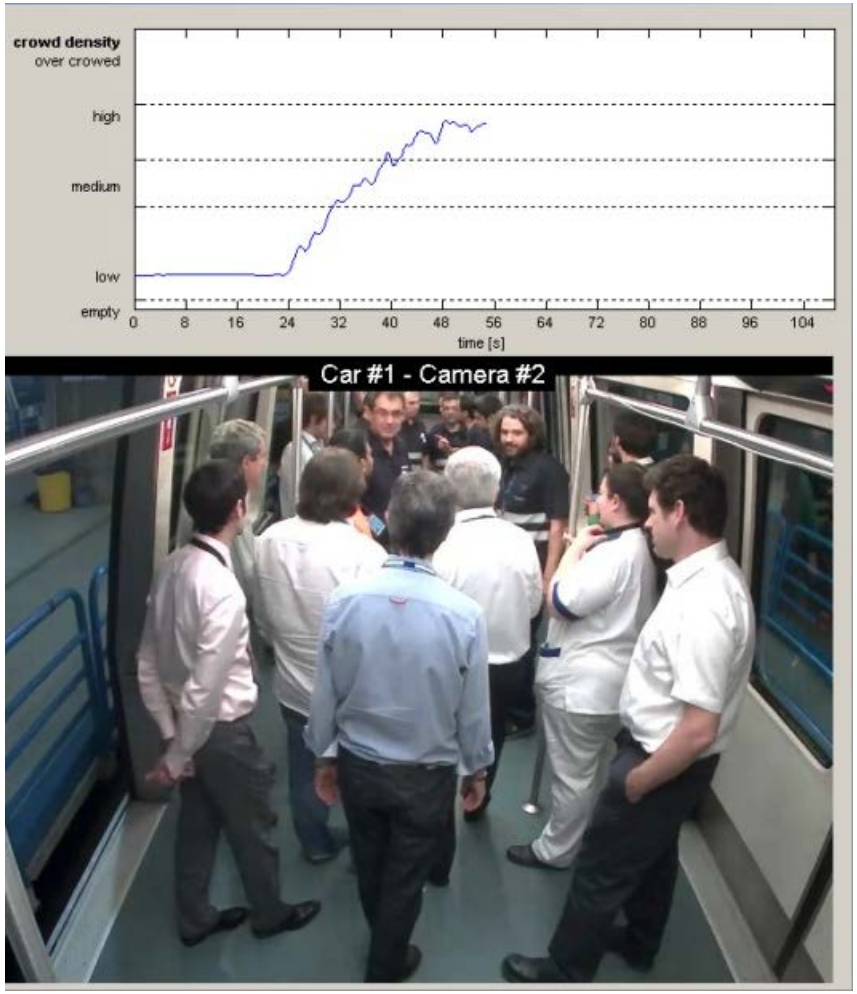
Video: download link

Crowd Density Detection

On-Board the train

Why do we need it?

- At present, it is not possible for the operator to view the sheer number of on-board videos continuously.
- Crowd Density Detection will help the operator to make pre-caution activities during any security related abnormal situations.
- Adapt trains schedule, as operationally needed can reduce costs (remove train if possible) and improve passengers comfort (add strain when available)



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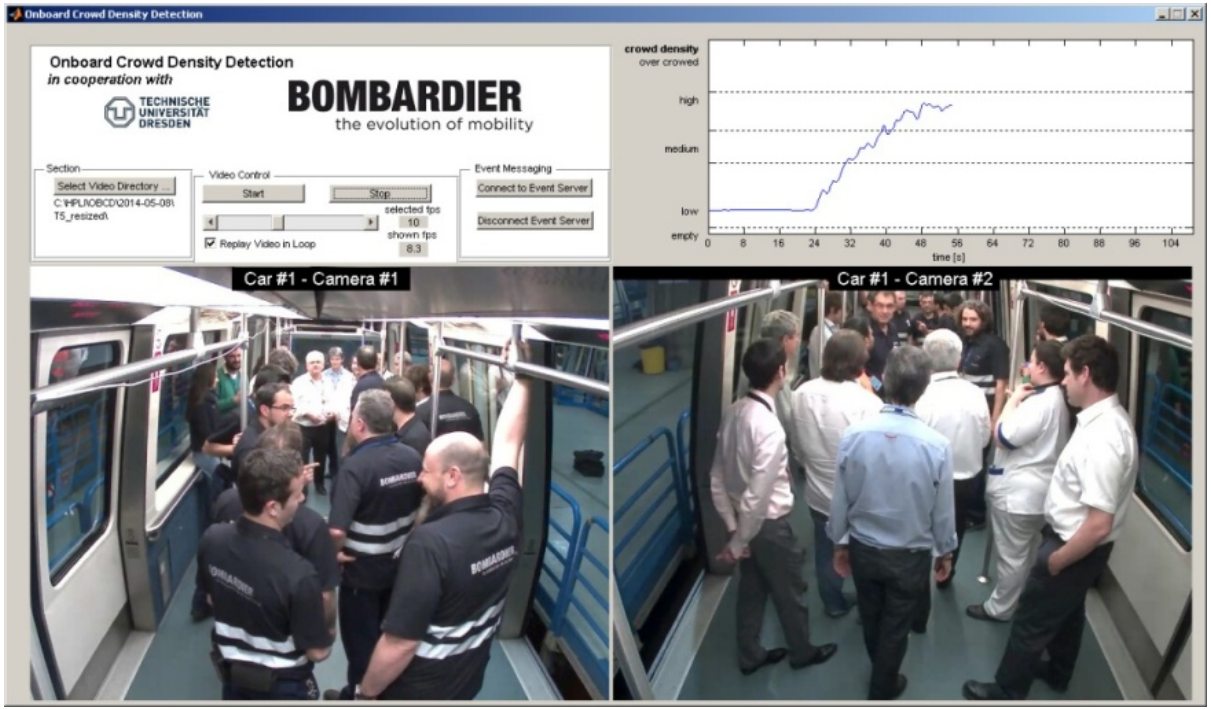
Crowd Density Detection

On-Board the train

How does it work?

- Continuous measurement of the on-board crowd density using multiple video sources.
- Video analytics compare the real-time image of the certain area with a reference picture of the empty train.
- Different thresholds can be defined, and trigger sending of a CAP event, whenever a certain level is reached.
- Decision-making workflow procedures can be launched based on this event.
- Visualize and locate the crowd density status and real-time and link to related videos and snapshots.



Integration of legacy systems

Approach to the PRAIL interoperability framework

Why do we need it?

- Need to aggregate real time information from legacy systems into a modern SOA architecture
- Integration of legacy systems in operation: I/O based PLC Modules, various Field busses and SCADA system
- Show the ease of integration into the PROTECTRAIL interoperability framework
- Various integration methods

Integration of legacy systems

Approach to the PRAIL interoperability framework

How does it work?

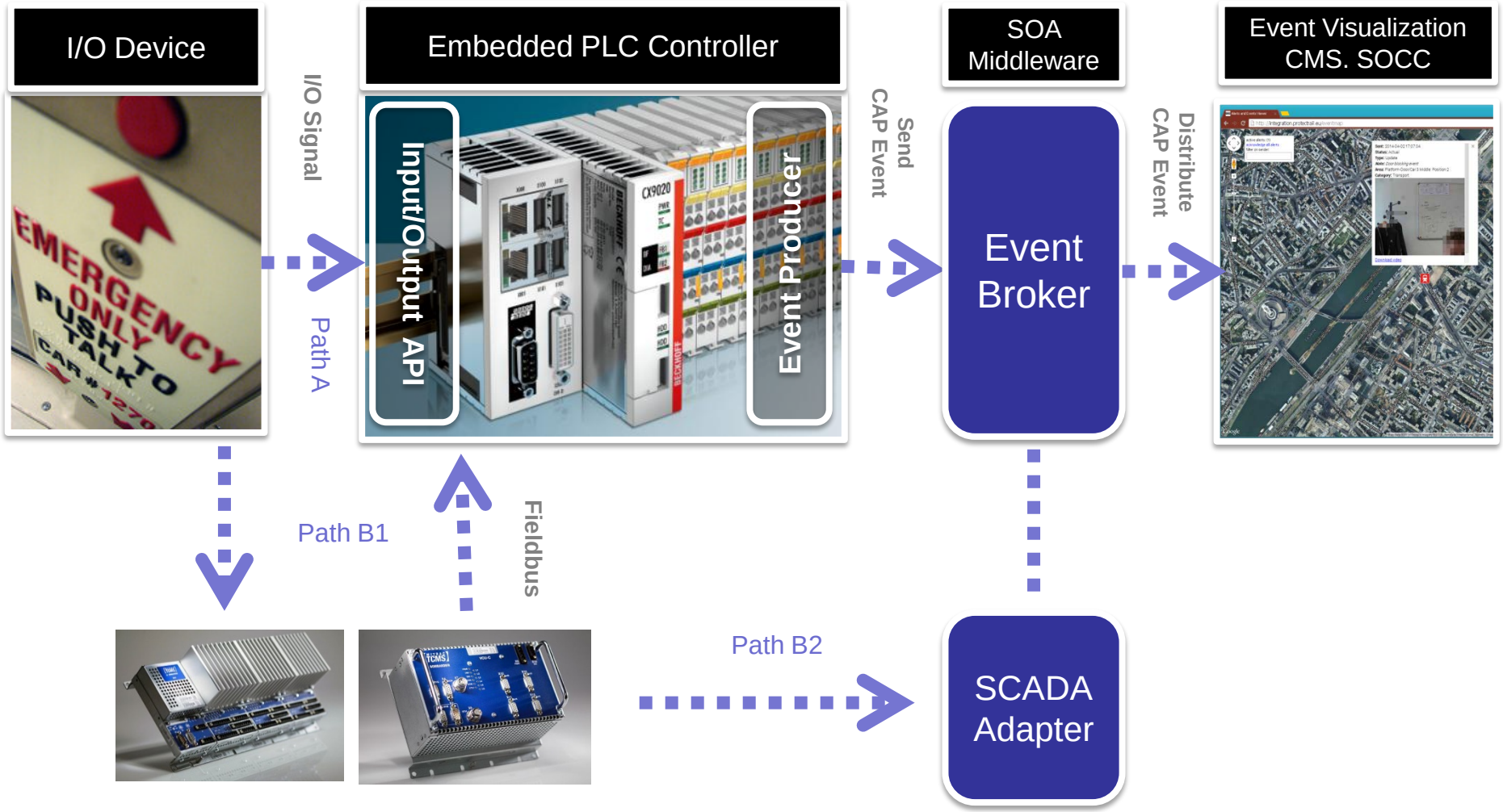
- On-board and wayside sensors are connected with digital I/O's through PLC controllers
- Develop a generic legacy connector to integrate existing devices and sensors into the interoperability framework like train doors, emergency buttons, motion detectors
- A cost effective industrial embedded PC connects I/O devices and on-board and wayside systems
- PLC is SOA enabled and designed to send CAP Events to the Event Broker
- Enrich the sensor information with location, time and other human understandable information
- Rapid software development time in less than 8h

I/O Device

Embedded PLC Controller

Integration of legacy systems

Integration Methods



Next ……

On-board to ground protocol for emergency and situation assessment

Thales + Alstom